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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/646,849	10/17/2000	Tatsuzo Ishida	TNAB-T0158	1114

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EXAMINER

FLETCHER, MARLON T

ART UNIT PAPER NUMBER

2837

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/646,849

Applicant(s)

ISHIDA ET AL.

Examiner

Marlon T Fletcher

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6,8,9 and 11-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6,8,9 and 11-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT-Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
-

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 4, 6, 8, 9, 11-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onaga et al. (4,807,153) in view of Tsai et al. (5,245,263), Villaret (6,222,338) and Takenaka et al. (6,064,167).

As recited in claims 1, 4, 6, 9, and 23-30, Onaga et al. disclose a robot device and control method including a joint mechanism control apparatus and method as seen in figures 1 and 2 and as discussed in column 5, lines 5-8, having an actuator for generating a rotation torque whose level depends on a drive current, connecting a first link to a second link as freely rotating on an predetermined axis, and rotating the first link on the predetermined axis based on the rotation torque output from the actuator through an output axis of the actuator as discussed in column 4, lines 36-45, characterized by comprising: electric current detection means for detecting an electric current value of the drive current of the actuator as discussed in column 6, lines 5-18, lines 48-57, column 7, lines 60-64, column 16, lines 31-34, and column 18, lines 47-62; and external force torque detection means for detecting a level of a torque by an external force applied to the output axis of the actuator based on the electric current

value detected by said electric current detection means as discussed in column 6, lines 5-18, column 6, line 58 through column 7, line 2, column 15, line 30 through column 16, line 30, and column 18, lines 47-62.

Onaga et al. disclose the robot device and method including the joint mechanism control apparatus and method, characterized by further comprising: control means for controlling the actuator based on a detection result from said external force torque detection unit such that the external force applied to the output axis of the actuator can be removed as discussed in column 6, line 58 through column 7, line 2, column 15, lines 32-54, and column 16, lines 7-30.

As recited in claims 3, 8, and 14-17, Onaga et al. disclose the robot device and method including the joint mechanism control apparatus and method, characterized in that: said actuator comprises: a motor unit generating the rotation torque depending on a supplied drive current as discussed in column 6, lines 5-15; a torque amplification unit (174, 150) amplifying the rotation torque generated by said motor unit, and transmits the torque to said output axis as discussed in column 6, lines 8-15 and lines 58-65; and motor control means for controlling said motor unit by supplying said motor unit with the drive current at a level according to externally provided control information, and said motor control unit is provided in said motor unit as discussed in column 6, lines 11-15 and lines 48-57, column 8, lines 11-14, and column 15, lines 32-45.

As recited in claims 11, 13, and 18-30, Onaga et al. disclose a robot device and method having characterized by comprising: an actuator, provided in a joint mechanism, generating a rotation torque whose level depends on a drive current for rotation-driving

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said arm unit on a predetermined axis; electric current detection means for detecting an electric current value of the drive current of the actuator as discussed in column 6, lines 5-18, lines 48-57, column 7, lines 60-64, column 16, lines 31-34, and column 18, lines 47-62; and external force torque detection means for detecting a level of a torque by an

external force applied to the output axis of the actuator based on the electric current value detected by said electric current detection means as discussed in column 6, lines 5-18, column 6, line 58 through column 7, line 2, column 15, line 30 through column 16, line 30, and column 18, lines 47-62; and control means for controlling the actuator based on a detection result from said external force torque detection unit such that the external force applied to the output axis of the actuator can be removed as discussed in column 6, line 58 through column 7, line 2, column 15, lines 32-54, and column 16, lines 7-30.

As recited in claim 12, Onaga et al. disclose the robot device, characterized in that: said actuator comprises: a motor unit generating the rotation torque depending on a supplied drive current as discussed in column 6, lines 5-15; a torque amplification unit (174, 150) amplifying the rotation torque generated by said motor unit, and transmits the torque to said output axis as discussed in column 6, lines 8-15 and lines 58-65; and motor control means for controlling said motor unit by supplying said motor unit with the drive current at a level according to externally provided control information, and said motor control means is provided in said motor unit as discussed in column 6, lines 11-15 and lines 48-57, column 8, lines 11-14, and column 15, lines 32-45.

Onaga et al. do not teach the actuator including a current detector, a torque detector, and control means. Onaga et al. further do not disclose a pair of leg units in each of which a lower leg unit is connected to a thigh unit through a knee joint mechanism, and a foot unit is connected to the lower leg unit through an ankle joint mechanism.

However, Tsai et al. disclose an actuator (2 and 3) including control means as well as current (inherent) and torque detectors as discussed in column 9, lines 3-19 and as seen in figure 3.

Villaret is provided to more clearly show the use of torque detectors and current detectors, along with the motor, all included in an actuator case (31), wherein the actuator (31) is the controller as seen in figure 3, wherein the actuator can be used in conjunction with a robot as discussed in column 1, lines 13-17 and column 6, lines 17-24.

Takenaka et al. are provided to show the well known elements in the art, that robots comprise leg units which include a lower leg, a knee joint mechanism, a foot, and an ankle.

It would have been obvious to one of ordinary skill art at the time of the invention to utilize the teachings of Tsai et al., Villaret, and Takenaka et al. with the apparatus of Onaga et al., because Tsai et al., Villaret, and Takenaka et al., enhance the apparatus of Onaga et al. by providing the operating joint or motor with controller for controlling that joint, wherein current and torque is detected to provide control by the actuators to the joints, which inherently reduces wiring. In combination, it is believed that every

element recited in the claims are met by the references. All of the references are related to the robot art and therefore, can be combined.

Response to Arguments

3. Applicant's arguments filed 05/19/2003 have been fully considered but they are not persuasive.

It is believed that the above rejection, provides the teachings of the present invention, wherein Onaga et al. provide all of the elements claimed, but fails to provide the elements all included in the actuator or actuator case. Tsai et al. provide the actuator including the controller and the motor, wherein torque is detected, which inherently provides a detection of current. However, Villaret is provided to show that the torque sensor, as well as the current sensor, can be provided in the actuator or actuator case for providing control of the actuator. In use in the robot art, the combination would provide less wiring. Tsai et al. show a reduction of wiring in figure 3, wherein the controller and motor are provided together. The applicant argues that Villaret shows the servo controller containing the elements and not the motor or actuator. However, a servo controller or mechanism can be considered an actuator, wherein the servo comprises the motor and the elements cited above used in controlling the motor, wherein all of the elements are in one case or part (31) as seen in figure 3. Regardless of the view, this method reduces wiring.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon T Fletcher whose telephone number is 703-308-0848. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on 703-308-3370. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Marion T. Fletcher
Primary Examiner
Art Unit 2837

MTF
July 27, 2003